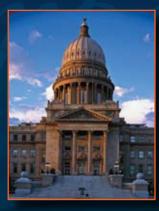
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An analysis
of INL's impact
on the Idaho
economy



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December 2006



Idaho National Laboratory

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This report analyzes three dimensions of INL's impact upon the state and region.

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Economic Impact Study

Idaho National Laboratory contracted with Boise State University to evaluate the effects of all cleanup, research and administrative operations at the INL site on the Idaho economy. Throughout this document, whenever "INL" or "the Lab" is cited, the terms refer to the combination of all federal agencies and private contractors doing business at the INL site. Structurally, this report provides an analysis of three dimensions of the Lab's contributions to the state and region. One is the economic dimension, including the impacts on employment, personal income and total output for the state. Another dimension is the fiscal impact. This accommodates the impacts of the Lab and its employees on state and local tax revenues. Finally, this report analyzes the community impacts of INL. This examines the effects of charitable contributions, educational outreach and volunteer activities on the surrounding communities and the state.

Section 1: Introduction

Idaho National Laboratory (INL) occupies a unique niche at the nexus of energy supply and security research. One of only 10 multiprogram national laboratories owned by the U.S. Department of Energy (DOE), INL performs work in support of the agency's mission to discover the solutions to power and secure America's future.

As DOE's designated nuclear energy research, development and demonstration leader, INL plays a key role in the global nuclear energy renaissance – the new worldwide reconsideration and expansion of nuclear energy based on its capacity to deliver power cleanly, safely, reliably and on a massive scale.

INL's historical contributions to nuclear science and engineering are considerable – beginning with production of the world's first usable amounts of electricity from nuclear power and continuing with the design and construction of 52 mostly first-of-their kind nuclear reactors for design concept and materials testing as well as safety code development.

Along with leading nuclear energy research, INL is focused on forming new partnerships across the energy spectrum by working internationally with governments, industry, major academic centers and other laboratories.

This collaborative work includes key energy development research in fossil fuels, alternative and renewable fuels and systems. INL began contributing to hybrid and electrical vehicle testing and research in association with significant global companies in the early 1980s. INL performs important research in hydrogen production, battery storage systems, wind, cellulosic ethanol and carbon conversion. INL is one of three lead laboratories for the DOE Geothermal Program and is lead laboratory for engineering support to the DOE National Hydropower Program.

Another important role for INL is making significant contributions to national and

homeland security – engineering solutions and developing technologies for the War on Terror. INL is an innovator in science-based, integrated engineering systems for the departments of Defense and Homeland Security, the Intelligence Community and others. Examples include armor solutions, munitions assessment systems and advanced detection technologies for nuclear materials, chemicals and explosives.

INL is home to the unparalleled Critical Infrastructure Test Range, with assets as diverse as an isolable electric grid and wireless test bed, as well as an internationally recognized cyber security program. Building on these resources, INL is continuing its drive to create a Center of Excellence for Electric Grid Reliability for the electric power industry and government agencies by 2010.

Broad research disciplines represented at INL include earth sciences and environmental engineering, biotechnology, physical systems modeling, systems engineering, intelligent automation and remote systems, applied engineering, materials processing, chemical separations and processing, and sensing and diagnostics.

INL's world-class capabilities in science, technology and engineering provide a resource of exceptional depth and breadth to the state, the nation and the world.

INL's historical contributions to nuclear science and engineering are considerable — beginning with production of the world's first usable amounts of electricity from nuclear power.

Section 2: INL Impacts at a Glance

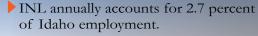
INL is the third largest employer in Idaho.

The analysis performed here shows that, with 8,452 employees and an annual budget in excess of \$1.227 billion, INL is the third largest employer in the state, ranking behind state government and just behind Micron Technology, Inc. It is by far the largest employer in eastern Idaho.



INL operations annually account for 19,860 jobs in Idaho.

The combined direct and secondary economic impacts of INL account for 15,570 jobs in the state of Idaho. This amounts to an employment multiplier of 1.84. In addition, there are longer-term effects on the economy due to the continued presence of the Lab in eastern Idaho. These effects account for an additional 4,290 jobs. The total impact of the Lab on employment in the state totals 19,860 jobs.

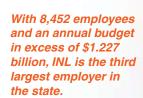


With 733,400 people employed in Idaho in 2006, the direct and secondary impacts of INL account for 2.1 percent of the total workforce in the state and over 9 percent of employment in eastern Idaho. Including the longer-term effects on employment, INL accounts for 2.7 percent of Idaho employment.

- of personal income in Idaho.

 The direct and secondary effects on personal income amount to \$1.108 billion annually.

 With annual personal income in Idaho estimated to be \$43.95 billion in 2006, the Lab accounts for 2.52 percent of total personal income in the state.
- Fiscal impacts of Idaho state tax revenues by INL and its employees approach \$85 million. INL and its employees make payments to the state in the form of personal income, corporate income, sales and other taxes. These payments amount to \$57.9 million. The





estimated secondary impacts of these direct payments are \$26.6 million.

INL accounts for 3% of total Idaho tax revenues.

The direct and secondary fiscal effects of personal income tax, corporate income tax, sales tax and other tax payments by INL approach 3% of all tax revenues received by the state of Idaho from all sources. Only Micron Technology, Inc., contributes a commensurate amount to Idaho government.

Direct tax payments to the state of Idaho by INL and its employees exceed the cost of state-provided services.

The total state budget per capita is \$1,442. State tax payments by INL employees for themselves and their families amount to \$1,926 per capita.

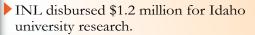


The charitable contributions of INL employees in 2006 amount to \$33.6 million. Employees in Idaho also contributed 221,000 hours of volunteer services with a market value of \$3.4 million.

- Annual property tax payments by INL employees approach \$23 million.

 INL employees and retirees living in Idaho pay \$22.9 million annually in property taxes.
- INL provides \$3.4 million for continuing education.

The Lab paid \$3.4 million to Idaho colleges and universities for the continuing education of its employees.



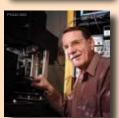
The Lab contributes \$1.2 million in grants to universities in Idaho for science and technology research and development.

INL annual charitable contributions total \$44.3 million.

The charitable contributions of INL employees in 2006 amount to \$33.6 million. Employees in Idaho also contributed 221,000 hours of volunteer services with a market value of \$3.4 million. In addition, the Lab contributed property with an acquisition value of \$7.3 million.

The total impact of the Lab on employment in the state amounts to 19,860 jobs.





Section 3: Economic Impacts

Locating a large firm or facility in a region impacts employment and income through three main avenues. First, there are the direct effects of employment and salaries of the facility. In addition, there are secondary impacts caused by the purchases of services and by the re-spending of direct dollars in the local and regional economies. The direct and secondary effects are well known to economists, and the impacts are assessed by employing standard estimation methods. The procedure used in this report is known as Input-Output (I-O) analysis.

In addition to the direct and indirect impacts, there are tertiary effects that arise when the presence of a large facility attracts firms and workers not directly related to the facility. These effects, also known as agglomeration effects, may arise when, for example, the completion of a large facility generates new infrastructure such as highways and airports. This, in turn, may attract other firms.

INL is the largest employer in the region and the third largest employer in the state. Unlike the state's largest employer – state government – the workforce at INL is concentrated in one region.

Locating a large firm or facility in a region impacts employment and income through direct, secondary and tertiary avenues.



In addition, INL-based operations spend over \$500 million on goods and services in the state. As with employment, these expenditures are concentrated in eastern Idaho. The combined effects of a large number of employees and large expenditures in a relatively rural area lead to large tertiary effects on the economy of the region. Thus, the Lab has a combined economic impact of direct, secondary and tertiary effects that is large relative to similar facilities located in more urban areas.

Input-Output Analysis

The economic importance of INL begins with the direct dollars spent in the region.

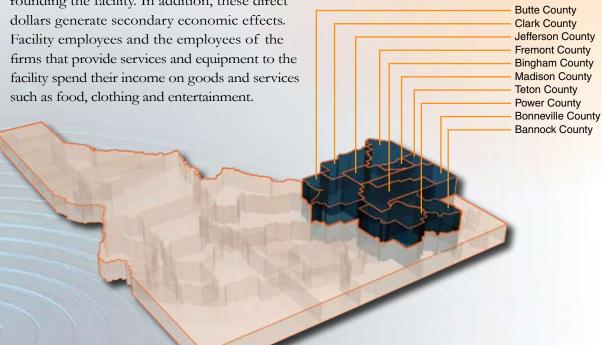
The table above provides a breakdown of the direct INL expenditures.

The vast majority of these expenditures go to residents and businesses proximal to the facility. For example, approximately 95 percent of wages and salaries, 85 percent of retirement benefits and 80 percent of purchases go to residents and businesses in the 10 counties surrounding the facility. In addition, these direct dollars generate secondary economic effects. Facility employees and the employees of the firms that provide services and equipment to the facility spend their income on goods and services such as food, clothing and entertainment.

The direct and secondary economic impacts are measured by standard I-O techniques that are modified to account for the rural nature of the region in which the Lab is located. Like all I-O models, the one employed here captures the interconnectedness of the regional economy by taking into account the fact that different types of industries buy inputs from each other and sell their products to each other. This is one way in which increases in output and employment in one industry will cause increases in output and employment in all the industries from which the first industry purchases its inputs.

According to I-O analysis, the presence of a given economic activity will explain some multiple of itself in related industry activities.

The vast majority of direct INL expenditures go to residents and businesses in the 10 counties surrounding the facility.





Analysis shows that INL is the third largest employer in the state and the largest employer in eastern Idaho.

This familiar multiplier effect is fundamental to regional employment and income analysis. The model employed in this study, however, is adapted for rural area analysis. In doing so, a traditional I-O model is modified to account for the openness of regional economies in Idaho, the presence of local government and investment accounts and the existence of multi-county economic regions. It is this latter approach that offers the most significant departure from traditional regional I-O studies.

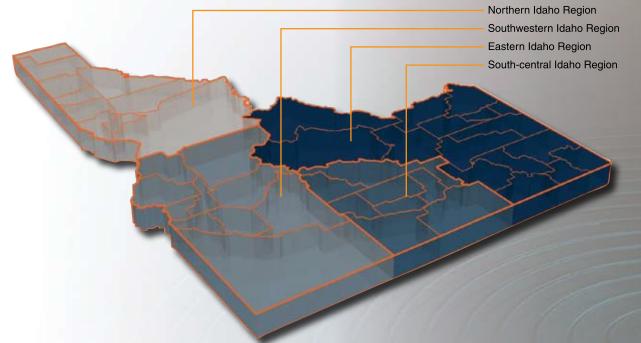
The first step in modifying the traditional I-O approach is to use a statewide model composed of four regional sub-models. The four regions are multi-county areas with boundaries defined by the U.S. Department of Commerce's Bureau of Economic Analysis (BEA) Economic Region Project. The regions are eastern Idaho, south-central Idaho, southwestern Idaho and northern Idaho. Each regional model contains 208 sectors of the economy plus sectors for state/local and federal government. The use of separate sub-models in the statewide economic I-O model is to correct for estimation errors that would arise from using statewide models to estimate regional impacts. Another reason for

using separate sub-models of the state economy is to allow the I-O analysis to reflect unique local production conditions. Most regional I-O models use national coefficients for each industry. Local conditions, however, can be much different than national averages.

The sales, earnings and employment in 208 sectors of the southeastern economic region, as well as for state/local and federal government sectors, are used in the I-O analysis. The direct purchases of the facility are identified and, in effect, built into the architecture of the overall model. The model shows the direct jobs and incomes at the facility itself and the indirect jobs and incomes elsewhere in the economy attributable to the multiplier effects of facility procurement and employee spending.

The analysis performed here shows, with 8,452 employees and an annual budget in excess of \$1.227 billion, the direct and secondary economic impacts of INL create 15,570 jobs in the state of Idaho annually, amounting to 2.7 percent of employment in Idaho. The direct and secondary effects on personal income amount to \$1.108 billion annually, amounting to 2.6 percent of total personal income in the state.

The statewide Input-Output model uses four multi-county regional submodels.





Tertiary Impacts

The direct and secondary impacts described above can be thought of as the short-term impacts because the analysis focuses on the short-term employment and economic multipliers. Over the longer term, however, it is important to keep in mind that the impact of large facilities can accumulate over time. During its nearly 60-year existence, the Lab has dramatically altered not only the workforce composition, but the economic landscape of the region as well.

For example, the presence of a major airport in Idaho Falls can largely be attributed to the population growth and economic activity generated by INL. The arrival of the airport in turn attracted distributors, shippers and other types of economic activity that may well have located elsewhere. The additional population where the research facility is located was enough to make the area a retail center. Without the facility, there would have been an entirely different pattern of economic development in eastern Idaho. In short, the economic growth generated by the construction of the facility and its continued presence acted as a magnet to other types of

economic activity. These tertiary effects are a vital part of the long-term growth of the regional economy. They are, in essence, the growth that occurs because industries are attracted to an area because of some degree of 'critical mass.'

In order to assess these longer-term tertiary effects, the approach used here begins by estimating the economic baseline of the region — what the economy of the area around the facility would look like if the facility had not located there. Comparing this baseline with the actual employment and income of the area currently will yield the overall economic impact of the facility. Subtracting the direct and secondary impacts, as estimated by the I-O analysis, will then yield an estimate of the size of the tertiary impacts stemming from the long-term effects of the Lab.

The tertiary effects of INL are estimated to create 4,280 jobs. These jobs, coupled with the jobs created through the direct and secondary impacts of INL, result in a total of 19,860 jobs attributable to the facility.

Section 4: Fiscal Impacts

The fiscal impacts of INL stem from several factors. This section examines the tax revenues generated by INL and paid to local and state governments. In addition, the nature and activities of the Lab and its workforce contribute significantly to the diversity and stability of the Idaho economy.

Tax Revenues

INL makes annual payments to the state of Idaho in the form of sales use taxes, franchise taxes, corporate income taxes and motor fuel taxes. In addition, current and former employees pay taxes to state and local governments in the form of income taxes, sales taxes and property taxes. The table on page 11 shows the direct payments by INL and its employees in state taxes. In addition, the table shows the estimated secondary impacts of these tax payments.

The overall fiscal impact of taxes and fees paid by INL and its employees totals nearly \$85 mil-

> lion. Total tax payments to the state of Idaho from all sources for the taxes and fees amount to \$2,917 milthese Idaho taxes and fees can be attributed to INL.

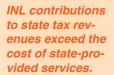
Only Micron Technology, Inc., approaches this large a contribution to funding state government in Idaho.

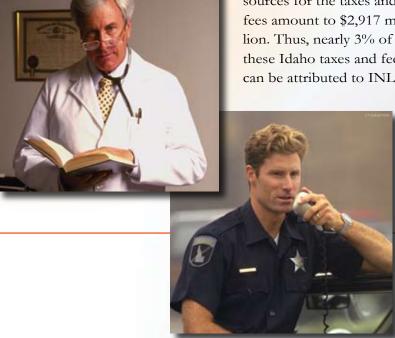
Although payments to state government are important, it is also important to consider the services provided by state government to its citizens. It is true that the fiscal impacts of INL are large, but the question remains as to whether these payments actually exceed the amount that the state provides in services. On a statewide basis, the total Idaho budget amounts to \$1,442 per capita. A conservative estimate, assuming only one INL employee per family, shows that INL's fiscal impacts amount to \$1,926 per INL family member. Thus, for state expenditures, INL contributions to state tax revenues exceed the cost of state-provided services.

The fiscal impacts of INL are large, but are not limited to the taxes and fees attributed to INL. It is important to realize that the revenues paid to state and local governments create jobs that benefit the state and, especially, the local economies. These employment effects of the Lab are significant. These employment effects account for nearly 600 jobs in education at the local level and over 100 jobs sustained in higher education.

Diversity and Stability

In addition to making significant contributions of revenues for state and local governments, the Lab contributes greatly to making Idaho more economically diverse. The presence of INL and its workforce has changed the







Fiscal Impacts of Taxes Paid to State of Idaho (in millions)			
	Direct	Secondary	Total
Personal Income Tax	19.3	9.6	28.9
Corporate Income Tax	8.1	2.2	10.3
State Sales Tax	22.6	11.5	34.1
Vehicle License Fees	1.7	0.9	2.6
Motor Fuels Tax	5.1	1.7	6.8
State Product taxes	1.2	0.7	1.9
Total Idaho Tax Impact	58.0	26.6	84.6

employment composition of eastern Idaho and the state as a whole. As a result, the state has become more economically diverse than it would have been without INL. With a more diverse economy, the economic fluctuations in any given sector have less impact on other parts of the economy. This is especially important in eastern Idaho.

Without INL, the eastern part of the state would be more reliant on agricultural production, agricultural inputs and transportation services – much of which is associated with agricultural output. These markets are subject to a great degree of volatility. Industrial diversity moderates this pattern as, with a greater diversity of industries, weakness in one industry is offset by strength in another.

The increase in economic stability caused by the presence of INL allows for more effective functioning of state and local governmental services. This allows state and local governments to maintain services during economic downturns when such services are needed most. This is especially important at the local level by providing stable funding for K-12 education and other services.



Without INL, the eastern part of the state would be more reliant on agricultural production, agricultural inputs and transportation services.





Section 5: Community Impacts

The economic and fiscal impacts of INL are vital components of the Lab's contribution to the state and the region. There are, however, additional impacts of having a facility of the size and importance of INL located in Idaho. These stem from the donated contributions of time and money by INL and its employees. Some of these contributions can, like the economic and fiscal impacts, be measured quantitatively. Others are less amenable to being measured in dollar terms but are no less significant.

For example, in 2006, charitable contributions of employees of the Lab totaled \$33.6 million. In addition, employees of INL spent over 221,000 hours in volunteer activities across the state, with a market value of \$3.4 million. This amount is calculated by taking the average hourly wage for Community and Social Service workers in the state of \$15.50 and multiplying it by the number of hours contributed by

INL employees to volunteer activities. The \$3.4 million in value for contributed volunteer activities would be higher if valued using the higher average wage for Community and Social Service workers in eastern Idaho.

Employees also made more than 150 presentations to schools and service organizations across the state, attended by more than 10,000 students as well as business and community members. INL awarded 39 grants totaling \$70,000 to public schools and school teachers throughout the state to help improve math, science and technology education. Additionally, INL scientists, engineers and researchers supported physics teachers workshops where high-school science teachers from across Idaho and the nation were brought to INL to get a hands-on opportunity to learn about nuclear energy and how to encourage student interest and achievement in science.

Further, the Lab makes significant contributions to technology-based economic development efforts across the state. From sponsoring and actively participating in initiatives such as Tech Launch 3.0, which brought Idaho innovators together with sources of development capital, to assisting with the start-up funding for Idaho's TechConnect system, INL has done much to strengthen the basic economic infrastructure of the state. Additionally, INL had a

The lab signed an agreement with NorthStar Nuclear Medicine to advance a major new technology for producing a valuable isotope used in cancer research and treatment.



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record year in the dollar value of its Cooperative Research and Development Agreements (CRADA) and licensing revenues with over \$1 million in royalties. INL experienced a near doubling of U.S. patents issued, while licensing option agreements more than doubled.

Finally, INL works closely with industries in Idaho to develop promising technologies and move them into the private sector. During the fiscal year, the lab signed an agreement with NorthStar Nuclear Medicine to advance a major new technology for producing a valuable isotope used in cancer research and treatment and tested isotope production for yet another company involved in cancer therapy development. In the national and homeland security arena, INL licensed its Tactical Timed Firing

INL licensed its Tactical Timed Firing Device to a Boise company – the same firm that licensed the INL-developed integrated breaching shotgun. Device to a Boise company – the same firm that licensed the INL-developed integrated breaching shotgun in 2005. These types of collaborative and reciprocal relationships have established INL as a preferred partner in a wide array of scientific fields.



Section 6: INL Facilities, Workforce and Research

The impacts of INL are significant because of the size and nature of the facility, the composition of its workforce and the extent of its accomplishments. This section provides brief descriptions of the facilities that comprise INL, the nature of its workforce and some of the research accomplishments of the Lab.

Facilities

Idaho National Laboratory is one of the largest of the national labs, both geographically and operationally. The facility has been in operation for over 55 years and occupies an 890-squaremile region in rural southeastern Idaho. The Lab is operated for the U.S. Department of Energy by Battelle Energy Alliance and supports three primary activities – nuclear energy research, development and demonstration; national and homeland security system and technology development and testing; and science and technology



The Reactor Technology Complex focuses on the design and testing of new technologies aimed at improving nuclear power reactors.

research. Environmental and cleanup projects also operate at the INL site and are managed by separate contractors.

Nuclear energy research is conducted at several diverse facilities, but perhaps most notably at the Reactor Technology Complex, located in the southwestern portion of INL's site. Activities at this facility focus on the design and testing of new technologies aimed at improving nuclear power reactors. Nuclear materials and processing research takes place at the Materials and Fuels Complex, formerly known as the Argonne National Laboratory—West. This facility is located in the eastern portion of the INL site and focuses on research on reactor fuels and other materials in order to improve the safety and efficiency of nuclear energy. The Science and Technology Campus consists of administrative, technical support, laboratories and computer facilities in Idaho Falls. In addition to supporting the other activities of INL, these facilities add to INL's strengths in scientific research and commercial product development.

Workforce

Because of the nature of the activities at the Lab, INL contributes a highly educated, stable and well-paid workforce to the Idaho economy. The educational attainment of INL's workforce is above the average for the state and the nation as a whole. For example, 99.7 percent of INL employees have at least a high school



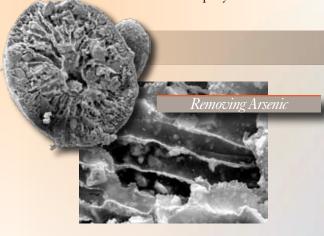
The Materials and Fuels Complex focuses on research to improve the safety and efficiency of nuclear energy.

degree compared to 89 percent of Idaho's population 25 years or older. Further, 55.2 percent of INL employees have a college degree compared to 25.9 percent of the Idaho population 25 years or older. Over 80 percent of INL's workforce is married, compared to only half of households for the U.S. as a whole.

The highly skilled and productive nature of the workforce means that INL workers are well compensated compared to the national average

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2006 was a banner year for Idaho National Laboratory researchers whose work was recognized with multiple international and national awards.

In *R&D Magazine's* worldwide competition for the top 100 technologies of the year, 22 INL researchers were selected to receive four R&D 100 Awards:

 Nano-Composite Arsenic Sorbent (N-CAS) – a longlasting, high-capacity nano-composite polymer particle engineered to remove arsenic concentrations from water – rendering it safe to drink and compliant with U.S. and world drinking water standards.



- Compact High Efficiency Natural Gas Liquefier – a new, patented process to deliver liquefied natural gas (LNG) directly from pipeline gas without pretreatment for CO₂ removal at prices competitive with large-scale LNG plants.
- Robot Intelligence Kernel a low-cost, onboard control architecture that gives robots exceptional new levels of autonomy and intelligence that revolutionizes robot capabilities and the robot/operator relationship.
- Xtreme Xylanase (Hemicellulase) a highly acid and thermostable xylanase (enzyme) that breaks down

and especially compared to incomes in the region. The relatively high incomes for INL workers help generate the economic impacts described earlier in this report, including relatively high income, sales and property taxes paid as well as the above-average charitable contributions made by INL workers.

Research Accomplishments

The nature of the scientific, research and development activities at the Lab means that the



The Science and Technology Campus consists of administrative, technical support, laboratories and computer facilities in Idaho Falls.

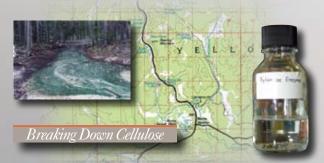
benefits created by INL go beyond community development. As an innovative leader, INL performs work on the cutting edge of research. INL also has a demonstrated track record of commitment to safety and was recently recertified to DOE's Voluntary Protection Program Star status. In addition, INL cleanup contractors continue to successfully implement their plans to reduce legacy environmental hazards and remove record amounts of transuranic waste from Idaho.

Summary

Whether improving quality of life through the development and commercialization of cutting-edge technologies, reducing risks through accelerated environmental cleanup, providing much needed tax revenues, or stabilizing and strengthening Idaho's economy by its mere presence, INL's overall impacts on Idaho are unquestionably significant. This report and the study it summarizes provide a means to quantify and help state residents better understand these considerable effects.

INL contributes a highly educated, stable and well-paid workforce to the Idaho economy.

INING RESEARCH



cellulose and hemicellulose from biomass into simple sugars used to produce fuels and chemicals.

N-CAS won a Nano50 Award from the NanoTech Briefs organization. This award recognizes technology advancements conducted at the nanotechnology level.

N-CAS, the Compact High Efficiency Natural Gas Liquefier, and the Robot Intelligence Kernel received Outstanding Technology Development Awards from the Federal Laboratory Consortium for Technology Transfer - Far West Region.

In the first annual Stoel Rives Idaho Innovation Awards program presented by the Idaho Department of



Commerce and Labor Office of Science & Technology, two of Idaho National Laboratory's five finalists in the 2006 Idaho Innovation Awards won their categories:

- Robot Intelligence Kernel (see previous description)
- Medical Actinium Therapeutic Treatment (MATT)
 - provides the medical isotope actinium-225 for use in cancer treatment, offering advantages over traditional treatment approaches.

Idaho National Laboratory

Mission

Ensure the nation's energy security with safe, competitive and sustainable energy systems and unique national and homeland security capabilities

Vision

Within ten years, INL will be the pre-eminent nuclear energy laboratory with synergistic, world-class, multiprogram capabilities and partnerships

Principal Priorities

- World-leading safety behavior, safety performance and environmental stewardship
- Respect and caring for our people
- Mission accomplishment

INL is one of the U.S. Department of Energy's multiprogram national laboratories and is managed by Battelle Energy Alliance, LLC.

